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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,567	02/10/2004	James K. Walker	NAN-108XC1	1444

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SALIWANCHIK LLOYD & SALIWANCHIK
A PROFESSIONAL ASSOCIATION
PO BOX 142950
GAINESVILLE, FL 32614-2950

EXAMINER	
WOLLSCHLAGER, JEFFREY MICHAEL	
ART UNIT	PAPER NUMBER
1732	
MAIL DATE	DELIVERY MODE
06/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/775,567	WALKER, JAMES K.	
	Examiner	Art Unit	
	Jeff Wollschlager	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-59* is/are pending in the application.

4a) Of the above claim(s) *9-11,19-22,33-35,39,42,45-48 and 54-58* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,12-18,23-32,36-38,40,41,43,44,49-53 and 59* is/are rejected.

7)☒ Claim(s) *1-8,12-18,23-32,36-38,40.41,43,44,49-53 and 59* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I including claims 1-8, 12-18, 23-32, 36-38, 40, 41, 43, 44, 49-53 and 59 in the reply filed on March 12, 2007 is acknowledged. Claims 9-11, 19-22, 33-35, 39, 42, 45-48 and 54-58 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-8, 12-18, 23-32, 36-38, 40, 41, 43, 44, 49-53 and 59 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 7,135,133 in view of Krins et al. (US 6,106,745). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Claim 1 of '133 patent claims a process for manufacturing a plastic optical transmission medium with a radially varying refractive index comprising: preparing a polymeric tube having at

least two concentric cylinders of polymeric material wherein at least one of the cylinders comprises a diffusible additive which modifies the refractive index of the polymeric material; surrounding said cylindrical volume with an outer tubing having a higher glass transition temperature than any of said cylinders of polymeric material; heating said polymeric tube to a temperature below the glass transition temperature of the outer tubing and above all of the glass transition temperatures of the cylinders of polymers, wherein such heating causes diffusion of the diffusible additive and wherein such diffusion modifies the radial refractive index. Claim 1 of the '133 patent further claims additional process steps.

Regarding claims 1, 2, 7, 13 and 59, Claim 1 of the '133 patent claims the process as set forth above. Claim 1 of the '133 patent does not claim that the polymers employed are prepolymeric materials or that the prepolymeric material is exposed to energy to increase the molecular weight of the prepolymeric material to convert it into a polymeric material. The examiner notes that the softening temperature of a polymer is intrinsically higher than its glass transition temperature.

However, Krins et al. teach an analogous process for producing graded index polymeric optical fibers wherein they teach the fibers are extruded/spun and cured, wherein the extrusion/spinning is performed with a polymer and monomer combination with only 20% to 70% polymer (i.e. a prepolymer/gel) in order to facilitate high process rates (col. 7, lines 36-40; Abstract). The monomer employed by Krins et al. is polymerized with energy such as heat and UV irradiation (col. 5, lines 51-col. 6, lines 14).

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to have employed the prepolymer/gel disclosed by Krins et al. in the process claimed in the '133 patent for the purpose of producing the same/similar product at higher processing rates as suggested by Krins et al.

As to claims 3-6, it has been held that the sequence of performing process steps is *prima facie* obvious absent new or unexpected results.

As to claim 8, Krins et al. teach exposing to UV irradiation.

As to claim 12, claim 2 of the '133 patent claims the diffusible additive is nonpolymerizing.

As to claims 14 and 16-18, claim 27 of the '133 patent claims perfluorinated materials are employed.

As to claims 15, claims 4 and 7 of the '133 patent claim the same materials and effects.

As to claims 23-32, 40 and 41 the examiner notes that the claimed physical properties and effects would be realized in the combination set forth above.

As to claims 36-38, the examiner notes that Krins et al. disclose the claimed process temperatures.

As to claims 43 and 44, claim 1 of the '133 patent further claims heating in an enclosure/oven

As to claim 49, stretching/drawing is a conventional step in the art.

As to claims 50-53, the combination set forth above employs the same claimed steps with the same claimed materials. As such the same effects and physical properties would be realized.

Claim Objections

Claims 1-8, 12-18, 23-32, 36-38, 40, 41, 43, 44, 49-53 and 59 are objected to because of the following informalities: The word "cylindrical" is incorrectly spelled "cylinderical" in claims 1 and 59. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8, 12-18, 23-32, 36-38, 40, 41, 43, 44, 49-53 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walker et al. (WO 01/78972, of record) in view of Krins et al. (US 6,106,745).

All citations to Walker et al. in this office action are from the US equivalent patent document: US 7,135,133.

Regarding claims 1, 2, 7, 13 and 59, Walker et al. disclose a process comprising: preparing a polymeric tube having at least two concentric cylinders of polymeric material wherein at least one of the cylinders comprises a diffusible additive which modifies the refractive index of the polymeric material; surrounding said cylindrical volume with an outer tubing having a higher glass transition temperature than any of said cylinders of polymeric material; heating said polymeric tube to a temperature below the glass transition temperature of the outer tubing and above all of the glass transition temperatures of the cylinders of polymers, wherein such heating causes diffusion of the diffusible additive and wherein such diffusion modifies the radial refractive index to produce either a graded index or step index plastic optical fiber (claim 1; Abstract; Figure 2A; col. 1, lines 42-65; col. 2, line 47-col. 3, lines 11; col. 4, line 5-9; col. 7, lines 38-63; col. 8, line 9 – col. 9, lines 59; col. 11, lines 6-8)

Walker et al. do not teach that the polymers employed are prepolymeric materials. Further, Walker et al. teach crosslinking the polymeric material by exposing the polymeric material to energy (col. 2, lines 61-65), which necessarily increases the molecular weight, but do

not teach that prepolymeric material is exposed to energy to increase the molecular weight of the prepolymeric material to convert it into a polymeric material.

However, Krins et al. teach an analogous process for producing graded index polymeric optical fibers wherein they teach the fibers are extruded/spun and cured, wherein the extrusion/spinning is performed with a polymer and monomer combination containing only 20% to 70% polymer (i.e. a prepolymer/gel) in order to facilitate high process rates (col. 7, lines 36-40; Abstract). The monomer employed by Krins et al. is polymerized with energy such as heat and UV irradiation (col. 5, lines 51-col. 6, lines 14).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have employed the prepolymer/gel disclosed by Krins et al. in the process taught by Walker et al. for the purpose, as suggested by Krins et al., of producing the same/similar product at higher processing rates.

As to claims 3-6, Walker et al. teach that the outer tubing can be placed around the cylinders at the time the cylinders are made (col. 8, line 9-col. 9, line 33; Figure 3B) or that the outer tubing can be added at a later time (col. 9, lines 34-59). Further, Walker et al. disclose that the UV-light can easily reach the polymeric material contained within the outer tubing (col. 11, lines 6-9). Accordingly, as Walker et al. teach surrounding the cylinders at different times, this suggests the exposing step also would happen at different times. Additionally, the prepolymeric material is heated as it is extruded/spun by Krins et al. and is further exposed to energy after the extrusion/spinning step (col. 5, lines 51-col. 6, lines 14; col. 7, lines 6-40). Further, it has been held that the sequence of performing process steps is *prima facie* obvious absent new or unexpected results.

As to claim 8, Krins et al. teach exposing to UV irradiation to cure the prepolymer/gel (col. 5, lines 51-col. 6, lines 14).

As to claim 12, Walker teaches the diffusible additive is nonpolymerizing (claim 2).

As to claim 14 Walker et al. teach perfluorinated materials are employed (Tables 1-4)

As to claims 15, Walker et al. teach the same materials are employed and the same effects are achieved (claims 4 and 7).

As to claim 16, Krins et al. disclose both fluorinated and chlorinated materials may be selected to produce a desired fiber (col. 8, lines 5-57)

As to claims 17 and 18, Walker et al. teach the materials may be the same or different (col. 7, lines 45-50).

As to claims 23 and 24, Walker et al. disclose polymeric materials meeting the claimed glass transition temperatures (Table 1).

As to claims 25-32, Walker et al. disclose the same base polymeric materials and diffusible additives (Tables 1-4). Walker et al. also disclose the additives may be added to the inner or outer cylinders (col. 1, lines 41-60). Further the combination as set forth above employs the same claimed process steps. Accordingly, the claimed physical properties and effects would intrinsically be realized.

As to claims 36-38, Krins et al. disclose the gel/prepolymeric material is extruded/spun at a temperature of about 85 °C (col. 7, lines 6-20) or lower (Example 1).

As to claims 40 and 41, Walker et al. teach the outer tubing preferably has a melt temperature above 200 °C and even above 250 °C (col. 8, lines 9-50).

As to claims 43 and 44, Walker et al. teach heating in an enclosure/oven on a rotating drum (Figure 2A (7), (8)). Walker et al. also provide an example where the step is performed at 150 °C (col. 16, lines 11-18).

As to claim 49, Walker et al. teach stretching/drawing of the material to improve mechanical properties (col. 10, lines 37-52). Additionally, Krins et al. exemplify a take up speed

of 5.5 m/min and an extrusion sped of 1.2 m/min (Example 1) while suggesting that the draw rate is a function of the polymer/monomer composition (col. 7, lines 20-35). Accordingly, the precise draw down ratio would have been readily optimized for various polymer/monomer compositions. Further, the draw dawn ratio would have been chosen to produce a fiber of the desired diameter as is well known in the art.

As to claims 50-53, the combination set forth above employs the same claimed steps with the same claimed materials. As such, the same effects and physical properties would be intrinsically realized.

Claims 1-8, 12-18, 23-32, 36-38, 40, 41, 43, 44, 49-53 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable Ho et al. (US 5,555,525) in view of Walker et al. (WO 01/78972, of record).

Regarding claims 1, 2, 7, 13 and 59, Ho et al. teach a method of making a graded refractive index polymeric fiber from two polymeric solutions containing two different monomers. The monomers diffuse to modify the refractive index in a diffusion zone, exemplified at a temperature of 90 °C, the two solutions are extruded concentrically and are ultimately polymerized (Abstract; col. 4, line 27-col. 5, lines 40; Example 3; Figure 1). The diffusion process may be further facilitated by additional heating of the material after it is fully polymerized (col. 5, lines 35-40). Ho et al. also disclose that a buffer layer is known to protect the cladding and the core (col. 1, lines 28-27) but do not expressly state the buffer layer is an outer tubing with the properties as claimed or do they expressly state the processing temperature relationships between the concentric material and the outer tubing.

However, Walker et al. disclose an analogous process of producing plastic optical fiber comprising: preparing a polymeric tube having at least two concentric cylinders of polymeric

material wherein at least one of the cylinders comprises a diffusible additive which modifies the refractive index of the polymeric material; surrounding said cylindrical volume with an outer tubing having a higher glass transition temperature than any of said cylinders of polymeric material; heating said polymeric tube to a temperature below the glass transition temperature of the outer tubing and above all of the glass transition temperatures of the cylinders of polymers, wherein such heating causes diffusion of the diffusible additive and wherein such diffusion modifies the radial refractive index to produce either a graded index or step index plastic optical fiber (claim 1; Abstract; Figure 2A; col. 1, lines 42-65; col. 2, line 47-col. 3, lines 11; col. 4, line 5-9; col. 7, lines 38-63; col. 8, line 9 – col. 9, lines 59; col. 11, lines 6-8).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method disclosed by Ho et al. and to have employed an outer tubing as taught by Walker et al. for the purpose of producing a plastic optical fiber with added temperature stability, mechanical strength and improved processability (Walker: col. 8, line 9- col. 9, line 55).

As to claims 3-6, Walker et al. teach that the outer tubing can be placed around the cylinders at the time the cylinders are made (col. 8, line 9-col. 9, line 33; Figure 3B) or that the outer tubing can be added at a later time (col. 9, lines 34-59). Further, Walker et al. disclose that the UV-light can easily reach the polymeric material contained within the outer tubing (col. 11, lines 6-9). Accordingly, as Walker et al. teach surrounding the cylinders at different times, this suggests the exposing step also would happen at different times. Additionally, the prepolymeric material is heated as it is extruded/spun by Ho et al. and is further exposed to energy after the extrusion/spinning step (col. 4, line 27-col. 5, lines 40). Further, it has been held that the sequence of performing process steps is *prima facie* obvious absent new or unexpected results.

As to claim 8, Ho et al. employ ultraviolet radiation (col. 5, lines 13-23 and 42-48).

As to claim 12, Walker teaches nonpolymerizing additives may also be employed (claim 2). One having ordinary skill would have been motivated to employ the nonpolymerizing additives to further control the refractive index as suggested by Walker.

As to claim 14 Walker et al. teach perfluorinated materials are employed (Tables 1-4) and Ho et al. disclose a wide range of fluorinated materials may be employed (col. 4, lines 38-60).

As to claims 15, Walker et al. teach the same materials are employed and the same effects are achieved (claims 4 and 7).

As to claims 17 and 18, Ho et al. exemplify the inner and outer layers with same base polymers and different monomers (Examples 1 and 3). Walker et al. teach the materials may be the same or different (col. 7, lines 45-50).

As to claims 23 and 24, Walker et al. disclose polymeric materials meeting the claimed glass transition temperatures (Table 1) and Ho et al. exemplify a wide variety of materials (col. 4, lines 38-60).

As to claims 25-32, Walker et al. disclose the same base polymeric materials and diffusible additives (Tables 1-4) and Ho et al. disclose a wide variety of polymers/monomers may be employed (col. 4, lines 27-59). Walker et al. also disclose the additives may be added to the inner or outer cylinders (col. 1, lines 41-60). Further the combination as set forth above employs the same claimed process steps. Accordingly, the claimed physical properties and effects would intrinsically be realized.

As to claims 40 and 41, Walker et al. teach the outer tubing preferably has a melt temperature above 200 °C and even above 250 °C (col. 8, lines 9-50).

As to claims 43 and 44, Ho et al. teach an additional heating step may be employed to further facilitate diffusion (col. 5, lines 35-41). Walker et al. teach heating in an enclosure/oven on a rotating drum (Figure 2A (7), (8)). Walker et al. also provide an example where the step is performed at 150 °C (col. 16, lines 11-18).

As to claims 50-53, the combination set forth above employs the same claimed steps with the same claimed materials. As such, the same effects and physical properties would be intrinsically realized.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamashita et al. (US 6,307,992) disclose an analogous process for producing graded or step indexed plastic optical fibers from polymer/monomer solutions (Example 10; col. 3, lines 36-47; Abstract; Claim 15; Figure 1A-C; col. 4, lines 3-7; col. 8, line 42- col. 9, lines 27).

US 6,576,166; US 6,563,994; and US 6,428,893 disclose analogous methods for producing plastic optical fibers from prepolymerized materials.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Wollschlager whose telephone number is 571-272-8937. The examiner can normally be reached on Monday - Thursday 7:00 - 4:45, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JW

Jeff Wollschlager
Examiner
Art Unit 1732

June 4, 2007

CHRISTINA JOHNSON
SUPERVISORY PATENT EXAMINER

6/8/07